WHAT IS CLAIMED IS:

1. A base station apparatus for estimating a velocity of a mobile station in a mobile communication system, comprising:

a channel estimator for receiving a signal on a radio channel from the mobile station and performing channel estimation using the received signal; and

a velocity estimator for detecting a power spectrum value of the channel estimator, and providing the channel estimator with a channel estimation coefficient for use during channel estimation according to a Doppler shift frequency value of power estimated from the mobile station when the velocity of the mobile station is unchanged.

2. The base station apparatus of claim 1, wherein when the velocity of the mobile station changes, the velocity estimator corrects , a power spectrum value for a predetermined time and provides the channel estimator with a channel estimation coefficient for use during channel estimation according to a Doppler frequency value based on the velocity of the corrected power spectrum value.

3. The base station apparatus of claim 1, wherein the velocity estimator comprises:

a power spectrum measurer for measuring a power spectrum according to an output value of the channel estimator;

a power compensator for power-compensating an output value of the power spectrum measurer with at least one of a correction value and a normal-state value according to whether the velocity of the mobile station changes;

an averager for averaging power values output from the power compensator for a predetermined time; and

a Doppler frequency detector for detecting a Doppler frequency according to an output of the averager and outputting a correction value for use during channel estimation according to the detected Doppler frequency.

4. The base station apparatus of claim 3, wherein the value compensated for by the power compensator is a value normalized by a maximum value of a transfer function of the channel estimator, given in the following equation.

$$C_{\max}\big|_{vIndx=v} = \max\{C(n)\big|_{vIndx=v}\},\ n=n1\sim nq$$

5. The base station apparatus of claim 3, wherein the Doppler frequency detector calculates a reciprocal of a correction value of a transfer function of the channel estimator for each velocity band in order to correct a Doppler power spectrum based on a channel estimation coefficient used during channel estimation according to the Doppler frequency.

6. The base station apparatus of claim 1, wherein the velocity estimator performs calculation on only a frequency index for each of a predetermined number of frequency bands using discrete Fourier transform (DFT).

7. A method for estimating a velocity of a mobile station in a base station of a mobile communication system, comprising the steps of:

receiving a signal on a radio channel from the mobile station and performing channel estimation using the received signal; and

detecting a power spectrum value from the channel-estimated signal, and outputting a channel estimation coefficient for use during channel estimation according to a Doppler shift frequency value of power estimated from the mobile station when the velocity of the mobile station is unchanged.

8. The method of claim 7, wherein when the velocity of the mobile station changes, the channel estimation step further comprises the step of

performing power spectrum value correction for a predetermined time and outputting a channel estimation coefficient for use during channel estimation according to a Doppler frequency based on the velocity from the corrected power spectrum value.

9. The method of claim 7, wherein the velocity estimation step comprises the steps of:

measuring a power spectrum of the channel-estimated power;

power-compensating the measured power spectrum with at least one of a correction value and a normal-state value according to whether the velocity of the mobile station changes;

receiving the power-compensated values and averaging the power-compensated values for a predetermined time; and

detecting a Doppler frequency according to the averaged value and outputting a correction value for use during channel estimation according to the detected Doppler frequency.

10. The method of claim 8, wherein the value compensated during power compensation is a value normalized by a maximum value of a transfer function of a channel estimator, given in the following equation.

$$C_{\max}\big|_{vIndx=v} = \max\{C(n)\big|_{vIndx=v}\},\ n=n1\sim nq$$

11. The method of claim 7, wherein a reciprocal of a correction value of a transfer function of a channel estimator is calculated for each velocity band in order to correct a Doppler power spectrum based on a channel estimation coefficient for use during channel estimation according to the Doppler frequency.

12. The method of claim 7, wherein the velocity estimation step comprises the step of performing calculation on only a frequency index for each

of a predetermined number of frequency bands using discrete Fourier transform (DFT).